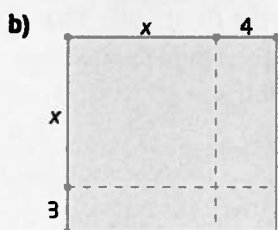
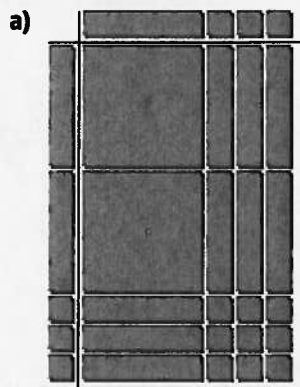


Chapter 5 Practice Test

1. What binomial product does each diagram illustrate?



2. Simplify.

- a) $4x^2(3x - 5y + 8z)$
b) $3m(6m^2 - 5m + 4) - (4m^3 - 8m^2 + 9)$

3. Expand and simplify.

- a) $(y + 5)(y + 9)$
b) $(4x - 7)(3x + 2)$
c) $(6k + 1)(6k - 1)$
d) $(w - 8)^2$
e) $(4c + 5d)^2$
f) $2(x - 4)(x - 7) - 5(8x - 9)(8x + 9)$

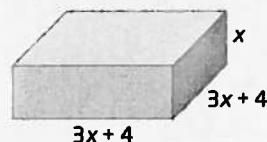
4. The minimum stopping distance, after a delay of 1 s, for a particular car is modelled by the formula $d = 0.006(s + 1)^2$, where d represents the stopping distance, in metres, and s represents the initial speed, in kilometres per hour.

- a) Expand and simplify the formula.
b) Compare the results in both versions of the formula for an initial speed of 60 km/h.

5. Factor.

- a) $9d^2e^2 + 6d^3e$
b) $15p^2qr^3 - 25p^3q^2r + 5pqr$
c) $5(x + 6) - 2(x + 6)$
d) $16x^2 + 8x - 6x - 3$

6. a) Find an algebraic expression for the surface area of the square-based prism.



- b) Expand and simplify your expression from part a).
c) Factor the resulting expression from part b).

7. Factor.

- a) $x^2 + 11x + 24$
b) $y^2 - 15y + 56$
c) $n^2 - n - 90$
d) $x^2 - 14x + 49$
e) $h^2 - 100$
f) $d^2 + 16d + 64$

8. Factor.

- a) $3k^2 + 12km - 36m^2$
b) $8y^2 + 19y + 6$
c) $9w^2 - 24w + 7$
d) $25a^2 + 60a + 36$
e) $121w^2 - 144$
f) $10x^2 - 7xy - 6y^2$

9. Explain how to determine whether or not you can factor $9x^2 - 10x + 18$ over the integers.

10. The area of a rectangle is given as $x^2 + 13x - 30$.

- a) Determine polynomials that represent the length and width of the rectangle.
b) What is the smallest integer value of x for which this area expression makes sense?

11. Determine all values of k so that each trinomial is a perfect square.

- a) $36x^2 + kx + 121$
- b) $49d^2 - 56d + k$
- c) $25x^2 - 60xy + ky^2$
- d) $ka^2 + 30ab + 9b^2$

12. a) Write an algebraic expression for the area of the shaded region.

$$\begin{array}{c} x+5 \\ x-5 \\ x+9 \end{array}$$

$$x+9$$

- b) Write the area expression in factored form.
 - c) Substitute $x = 7$ into both forms. Are the results the same? Why?
13. A parabola has equation $y = 2(x + 6)^2 - 2$.
- a) Expand and simplify to write the equation in the form $y = ax^2 + bx + c$.
 - b) Factor your equation from part a).
 - c) Do the three equations represent the same parabola? Justify your response.
14. The volume of a rectangular prism is given as $9x^3 - 30x^2 + 25x$.
- a) Determine algebraic expressions for the dimensions.
 - b) Describe the faces of the prism.
15. Determine two values of k so that each trinomial can be factored as a difference of squares.
- a) $km^2 - 25$
 - b) $16d^2 - k$
 - c) $a^2 - kb^2$

16. Factor to evaluate each difference.

- a) $34^2 - 31^2$
- b) $127^2 - 126^2$
- c) $52^2 - 48^2$

17. The first three diagrams in a pattern are shown.

- a) Write a formula for the total number of small squares in the n th diagram.
- b) Write a formula for the number of shaded small squares in the n th diagram.
- c) Write a formula for the number of unshaded small squares in the n th diagram.
- d) Write your formula from part c) in factored form.
- e) Show that both forms of the formula give the same results for the 15th diagram.

Achievement Check

18. a) Find all values of b so that $x^2 + bx + 10$ can be factored over the integers.
- b) Find all values of b so that $4y^2 + by + 5$ can be factored over the integers.
- c) Write an algebraic expression for the shaded area. Then, write the expression in factored form.

$$\begin{array}{c} x+2 \\ 4 \\ x+1 \quad 3 \end{array}$$